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ABSTRACT

At Edmonds Community College (Washington), the Campus Parent Child Care Center, which provides parent education and day care for children from 2-1/2 to 5 years of age, has extended the children's curriculum to include computer science instruction. First, the children are introduced to basic computer terminology, such as "keyboard," "monitor" and "disk drive." Next, they examine the computer and learn the mechanics of operating the machine and using a particular program. Use of the computer by the children has helped to demystify the technology and has led the center supervisors to conclude that: (1) the computer is a tool for use by the learner and is treated with respect by children; (2) working with computers does not isolate children; (3) children quickly learn to operate the equipment and develop a feeling of mastery; (4) computers do not substitute for teachers, but rather supplement their work; (5) the computer is a tool to enhance or reinforce learning; and (6) the computer helps teach the child to operate within a logical structure. Overall, it was concluded that microcomputers could be introduced as playthings and as a means of adding an extra dimension to a child's learning experience. (HB)

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MICROCOMPUTERS IN THE EARLY CHILDHOOD CLASSROOM

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MICROCOMPUTERS IN THE EARLY CHILDHOOD CLASSROOM

Edmonds Community College in Lynnwood, Washington, is the site of the Campus Parent Child Care Center, which provides day care services and parent education to student families, and serves as a training site for early childhood education students. Children attending the Center range in age from 2-1/2 through 5 years. Recently a new addition has been made to the children's curriculum--computer science. With an already rich curriculum and a busy day, what purposes can be served by adding a computer to the classroom? To understand the emergent need for such an addition, let's take a moment to examine the history of the "microcomputer revolution." The first electronic computer, designed in 1946, was a room sized machine, requiring trained technicians and a humidity and temperature controlled environment. However, by 1976, the first microcomputers became available to the general public. Within the next few years, computer sales soared as the fascinated public acquired these small desk top computers. By 1980, computers became the world's fourth largest industry and truly "the tools of tomorrow." In 1982, the computer was named Time magazine's "Machine of the Year," significantly edging out the traditional "Man of the Year" award. While microcomputers have come of age, many people are uncomfortable with this new technology and its overtones of math, science, and unfamiliar futuristic machines. Thus, one of the purposes of the introduction of computers in our early childhood education classroom is to familiarize children--and their families--with this new technology.

Demystification of computers begins in our classroom with an introduction to the vocabulary. To accomplish this, the microcomputer is first introduced at group time. Simple vocabulary terms such as "keyboard," "monitor," "disk

drive," and "floppy disk" are learned. One at a time, the children come forward to examine the computer, to learn to turn on the components and insert the disk. Later, after the group introduction, each child is again individually introduced to the computer and tutored in vocabulary, the mechanics of operating the machine, and use of a chosen program. Rules for participation have been developed which include a "computer sign-up sheet" to assure children of a turn. Because of the novelty of the activity, at first a session of fifteen minutes was adhered to rather strictly, but as time went by and the children felt assured of the continuing presence of the computer, rules were relaxed slightly. The need for supervision and instruction at first required the constant presence of the teacher. However, as the children became more skilled, the teacher was able to turn attention to other areas, returning to reinforce learning or to assist when problems arose.

The addition of any major piece of equipment into a childcare environment requires consideration of several factors, one of which is the arrangement of the environment to accommodate the change. Safety and supervision needs must be considered when placing the equipment. Maryalice Howe, at that time the Center Director and initiator of the children's use of the computer, placed the computer against a wall, out of the traffic path, but in full view of staff. Electrical cords were safely arranged behind the equipment. A sturdy table was remodeled to provide a secure base at the children's level.

Prior to the arrival of our microcomputer, none of the Center staff had experience with computer operation. Our computer was originally purchased for daycare record keeping, and planned for office use. If our original intent had been use with children, we might have made another choice, perhaps a less

expensive model or one with a greater history of classroom use. Selection of a computer (hardware) is somewhat a matter of personal preference and depends on the uses to be made of the computer. Our continuing research leads us to conclude that a good simple basis for decision making, aside from cost, is predicted use and availability of compatible software for that use. When we began to use the computer in the classroom, the goal was the development of computer literacy. Our concern was not, at that time, the acquisition or development of a comprehensive library of programs suitable for preschool use. There was, and continues to be, a serious scarcity of programs compatible with our computer and suitable for use with young children. However, we are convinced that the rising popularity of computers in educational settings will soon result in the development of more and better programs. Such development is already underway. Criteria used in our selection of software programs were developed with the assistance of parents and included compatibility with our computer system, age appropriate activities, non-violent activities, and when possible, programs which could be used to achieve one or more goals.

Our computer has been in the classroom for many months now, and we have made the following observations:

1. <u>The computer, as any other piece of equipment, is a tool for use by the learner</u>. We have found that the children, while they treat the machine with respect, are not in awe of it as are some adults. Their approaches to other classroom equipment such as puzzles, books, and blocks, will be reflected in their approaches to the computer. Those with long attention spans or those interested in problem solving will stay at the machine for

long periods; others will need encouragement to complete tasks. Those with patience will work to resolve technical difficulties; others will become angry or frustrated.

2. Working with computers does not isolate children. One of our greatest concerns in introducing the computer into the early childhood education classroom was that the children would relate to the machine and not to one another. This has not happened. One reason may be the placement of the computer in the classroom, as a part of the on-going activities. Another may be that while a computer "turns" list has been developed to protect each child's access to the computer, no restrictions were placed on cooperative use. Thus, there are often two or more children working together. Lively conversation, giggles, and groans of frustration are commonly heard in this area.

3. Children quickly learn to operate the equipment and have a feeling of mastery. There are three basic steps to be learned in order to operate the equipment. First, the disk is inserted into the disk drive, and the door closed; second, the CRT (cathode ray tube) or television, whichever you are using, is turned on; third, the computer is turned on. No one of these activities is more complex than turning on a television set. Most preschoolers with training can follow a three step direction. Our observations are substantiated by the observations of Swigger and James, and by Hungate, who also found that young children can master the computer. Swigger and James said that "given minimum directions, all of the children were able to master the skill of manipulating the figures and pressing the correct keys. None of the children appeared afraid of the

machine or incapable of understanding the programs" (3:11). Hungate concluded that "kindergarten children can both learn to use and learn from using computer programs which are tailored to their age level" (1:18). The pilot study done by Piestrup again substantiated our observations. She said, "...children who are very young can use computers easily, and gain in skills. They can use game paddles, a joy stick, and the standard keyboard divided into zones. Clearly, preschool children were not intimidated by a microcomputer and enjoyed using it as a part of their play" (6:10).

The programs we have chosen require a "press any key" approach or a simple character match. Research and development is accelerating in the construction of programs which enable preschool children to get and give instructions without reading skills. There is now on the market a program designed for children ages 2-1/2 and up.

4. Computers do not substitute for teachers; they supplement the teacher's work. One must keep in mind that a computer is a piece of equipment as is a blackboard or a textbook. How it will be used, and for what purposes, will be determined by the teacher. The studies by Swigger and Campbell suggest that after orientation, children use the computer most comfortably when adults are not present (3:11). We use a balance of "teacher present" and "teacher available" as the need warrants.

5. The computer is a tool to enhance or reinforce learning. Concept development requires many varied experiences. The computer alone does not provide a comprehensive learning environment. It has potential, however,

to serve as an excellent tool to illustrate a variety of concepts such as tall-short, fast-slow, above-below, and will be yet another way to reinforce correct responses with immediate feedback. The computer also has the capacity to impersonally inform the child of incorrect responses. Children appear to feel less judged by a computer. Hungate comments that "most of the children were not afraid to make a mistake with the computer, even though they were afraid in class when unsure of the answer" (1:16). This ability to encourage problem solving attempts, to reinforce appropriate responses, and to immediately correct errors should increase both confidence and learning efficiency.

6. Because the computer does not negotiate, the child recognizes the need to function within a logical structure. Children can adjust to rules, particularly if the rules are firm and consistent. Tantrums, whining, and erratic behavior will not cause the computer to change its method of operation. Impulsive children find that the computer will not perform satisfactorily unless appropriate procedures are followed. We have observed children express anger, call the computer names, but eventually say "ok," and begin to follow directions. Papert refers to this as "deliberately thinking like a computer," and says that "There are situations where this style of thinking is appropriate and useful." He goes on to propose that children can learn about styles of thinking and choose appropriate styles (2:27).

7. Although a logical structure is required, within that structure the child can master the computer. Our goal is not to develop computer programmers but to acquaint children and families with the basic skills needed for

operation of prepared computer programs, and more importantly, to feel comfortable and confident in the presence of a computer. We reached the same conclusion that Swigger and Campbell reached, that "...small children can and will use a computer" (9). The video tape which we have prepared shows children, after initial orientation, confidently using the equipment and enjoying the activity (7).

CONCLUSION

The microcomputer is a fact of contemporary life. Recent statistics indicate that 100,000 computers are currently placed in schools, with analysts predicting that this figure will grow annually by 60 percent (8:23). David D. Hade, in "Literacy in an Information Society" says, "The prominence of information in society and the high technology of electronic media and computers that control and disseminate information are facts that will not go away by ignoring or resisting them" (4). Many early childhood educators are responding to the introduction of new technology as Toffler predicted in The Third Wave, with fear and resistance (5). Perhaps this is due, in part, to what Luerman describes as "paltry technological training" at teachers' colleges and, in part, to a general fear of change, a romantic longing for the "good old days." (8:24) In addition, early childhood professionals have consistently defended children's right to play and also the value of play itself as an educational medium. To some, the computer appears as a threat to that right to play. They envision scenes of preschoolers, row after row, like corporate typists, bound to their computers. Certainly, that is something to guard against; the computer should not substitute for concrete and multiple experiences. Children will continue to need an enriched, sensorial, and

socially interactive environment. The microcomputer can, however, be introduced into that environment as a plaything, and as a means of adding an "extra dimension" to a child's learning experience (8:24). This has been our ultimate finding at Edmonds Community College: Computers and quality early childhood education can be not only compatible, but complementary.

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